

# FURTHER SUPPLEMENTARY RETURN

(145b).

FURTHER SUPPLEMENTARY RETURN TO AN ADDRESS OF THE HOUSE OF COMMONS, dated March 22, 1909, for a copy of all correspondence, reports, documents, Orders-in-Council, in the possession of the Government relating to the establishment of a Geodetic Service Bureau, and the commencement of a Geodetic Survey in Canada.

CHAS. MURPHY,  
*Secretary of State.*

*Memorial of the Council of the Canadian Society of Civil Engineers to the Right Hon. Sir Wilfrid Laurier, April 2, 1906. See page 30, Sessional Paper No. 145.*

*Order-in-Council constituting the Committee on Surveys, approved on November 13 1906. See page 42, Sessional Paper No. 145.*

*Acting Deputy Minister of Militia and Defence to the Deputy Minister of Public Works, November 28, 1906. See page 9, Sessional Paper No. 145a.*

*Mr. Steckel to the Chairman of the Committee on Surveys.*

OFFICE OF THE CHIEF CLERK IN CHARGE OF  
PARLIAMENTARY ESTIMATES,  
OTTAWA, Dec. 27, 1906.

Dr. W. F. KING, Chief Astronomer, &c.,  
Chairman, Dominion Topographical and  
Geodetic Survey Committee.

MEMORANDUM *re* SURVEYS UNDERTAKEN BY THE PUBLIC WORKS DEPARTMENT OF THE  
DOMINION OF CANADA.

Preliminary examinations and regular geometrical and trigonometrical surveys inclusive of levelling, sounding and gauging, are made either personally by officers of the department and their permanent assistants or by outside parties working under the direction of the chief officers in connection with the works and services under its control which are enumerated hereunder, viz:—

1. *Public Buildings.*—Sites required for the erection of post office, custom house, inland revenue, immigrant, quarantine and military buildings have to be examined, valued, reported on and surveyed inclusive of adjoining private and public buildings and grounds; also the rights of way which have to be secured for laying pipe lines required for projected water services at quarantine stations, &c.

2. *Harbours.*—Hydrographic surveys involving invariably more or less trigonometrical and topographical work have to be undertaken at many points along the sea coasts and shores of inland waters, chiefly in response to numerous petitions received every year from fishermen, settlers, mariners, merchants, municipalities, &c., praying for the construction of breakwaters, landing piers, beach protection works, &c., and the improvement of navigable waterways, harbour channels, sheltered areas, &c.



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3. *Rivers.*—Surveys are needed on fresh water streams, lakes and tideways, where improvements such as dams, locks, piers, revetment walls, slides and booms and dredging operations are projected or being carried out (a) for navigation purposes, (b) for the protection of the banks from erosion and the adjoining lands from destructive floods and ice shoves, (c) to facilitate the descent of round logs, square timber, pulp wood, railway ties, &c., and the sorting of such products of the forests in boomed areas, (d) for regulating the flow of water for navigation, industrial, domestic, agricultural and hygienic purposes.

4. *Interprovincial Bridges.*—The sites suggested by Local Governments, municipalities and other interested parties for the erection of such structures have to be surveyed inclusive of proposed approaches.

5. *Colonization Roads in Unorganized Territories.*—Reconnaissance and location surveys are necessary prior to the construction of such roads and the opening up of projected trails across the said territories for the transportation of the mails and general supplies for pioneer settlers, Indians, &c.

6. *Government Land and Cable Telegraph Lines.*—Where land lines have to be built across unexplored or unsettled districts and where cables are laid out of sight of land, it is desirable that sufficient lineal and angular measurements be made to determine approximately the length and position of such lines and cables.

7. *Projected navigable deep water route from the Georgian Bay, Lake Huron, to tidewater on the St. Lawrence via the Ottawa Valley.*—This very important survey is nearing completion, and I understand that all the principal triangulation points and bench marks required in this connection have been established on the ground in a permanent manner. Moreover, all the field plans are being inked in to facilitate reference thereto in the future, and it has been recommended that a complete set of copies of all the original note books be made for safe keeping in a separate vault.

8. *Geodetic Levelling.*—This survey which the undersigned succeeded, with some difficulty, in inaugurating in 1883, viz., some 23 years ago on the banks of the Richelieu River, has been carried on ever since, from time to time, under his direction; but in a very desultory manner, as the funds left at his disposal for this object and his other departmental duties would permit.

The ultimate object in view is the establishment of a precise level net all over the Dominion, as a rule along the principal rivers, railways and highways and with permanent metallic bench marks at intervals not exceeding four miles and temporary benches about one mile apart, all numbered in a uniform, distinctive and continuous manner.

On the east side of the Rocky Mountain 'Great Divide' it is intended to refer all the Geodetic elevations determined, to a national datum corresponding to the mean level of the Atlantic Ocean deduced from continuous records of tidal fluctuations at a tide station on Canadian Territory, as close as practicable to the mouth of the Gulf of St. Lawrence.

On the west side of the said 'great divide' or summit of the Rocky mountains, it may be found advisable to adopt for the Canadian datum plane to which all elevations determined on the Pacific slope of the Dominion are to be referred, the mean level of the Pacific Ocean as deduced from continuous series of tide curves registered either at Steveston, near the mouth of the Fraser river, at Vancouver, at Prince Rupert or at some other point on the main land along the Pacific Coast, north of the boundary line between the United States of America and Canada.

A 'résumé' of the geodetic levelling operations thus far carried on in Canada which contains a summary description of the instruments used and the methods of observation followed, inclusive of the improvements made in both instruments and methods, is to be published as an appendix to the Annual Report of the Minister of Public Works for the fiscal year ended June 30, 1906, to be laid before parliament at its present session.



## SESSIONAL PAPER No. 145b

This 'résumé' was prepared by the undersigned at the request of Dr. Deville, surveyor general, for transmission to the director of the Ordnance Survey of Great Britain at Southampton, who applied to the Department of the Interior for this information on behalf of Mr. Charles Lallemand, director of the 'Nivellement Général de France.'

On all geometrical surveys undertaken by officers of the Public Works Department the linear measurements are generally made in English feet and decimals, in some cases, however, feet and inches have been used. For angular measurements the sexagesimal division of the circle has invariably been adhered to. Bearings are nearly always given in reference to the ever changing magnetic meridian without the position of the true meridian being also indicated. Bench marks of a more or less permanent nature have been made in connection with most surveys carried on by the present Public Works Department, viz.:—since its creation in 1879; but their altitudes above some kind of a rational general datum plane are given in but few instances, apart from the geodetic bench marks above referred to.

As regards the scales to which the maps, plans, profiles and cross sections on record in the various branches of the department are drawn, no rule appears to have been laid down, so far, for the guidance of the officers in this respect; a great variety of scales are in use, generally speaking, however, feet measured on the ground are represented by inches on the paper.

In all departmental surveys, the portions of the terrestrial globe measured, have with very few exceptions, been considered to be plane surfaces.

The only kind of projection ever used in the Department to the knowledge of the undersigned, is the rectangular polyconic, which is that generally favoured by the United States Coast and Geodetic Survey for maps of large sections of that country.

All the reports made by the chief officers of the department with the accompanying drawings are sent to the secretary and handed over by him to the Record branch where they are covered, classified under some 36 different subjects and numbered continuously. Brief summaries of the contents are written on the covers, which are subsequently entered in journals numbered correspondingly with the various subjects handled. The public buildings under the control of the Department in a Province form a subject; also the harbours, rivers, slides, telegraphs, &c. The covered and numbered documents are kept in series of file cases, and any accompanying plans that cannot be folded to the proper dimensions for filing away with the papers, are kept in special drawers either in the General Record Room or in the branch to which they belong.

There is no regular system followed at head-quarters for the safe keeping of survey field books, gauge registers, estimate books, &c., &c.; as a rule, however, the maps, plans, profiles, cross sections, &c., sent to the Department, or prepared at head-quarters, are numbered, indexed and kept in chests of drawers or on racks with distinctive reference marks, where hands can readily be laid on any drawings desired. The greater number of such documents preserved in the Engineering Branch of the Department at headquarters up to 1897—were destroyed in the Western Block conflagration on the 11th February of that year. Quite a number of drawings are also filed in the Law Clerk's office in connection with the contracts entered into by the Department.

The Engineers in charge of districts, of course, keep for their own convenience, records of all the surveys, reports, estimates and specifications they are called upon to make—inclusive of all the drawings they have to prepare in connection with the same.

R. STECKEL,

*Representative of the  
Public Works Department.*



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*Report of the 'Committee on Surveys,' to the Minister of Militia and Defence, February 15, 1907. See page 35, Sessional Paper No. 145.*

*Extracts from statements or reports showing the practical benefits derived from topographical surveys. See page 39, Sessional Paper No. 145.*

*Objections of Mr. Steckel to the report of the majority of the Committee on Surveys. See page 47, Sessional Paper No. 145.*

*Mr. Steckel to the Secretary of the Department of Public Works:—*

OFFICE OF THE CHIEF CLERK IN CHARGE OF  
PARLIAMENTARY ESTIMATES,  
OTTAWA, March 2, 1907.

FRED. GÉLINAS, Esq.,  
Secretary,  
Department of Public Works.

SIR,—I have the honour to transmit herewith for the information of the department, a copy of the final report adopted February 15th last by the majority of the Survey Committee constituted under an Order-in-Council dated November 13, 1906—for submission to the Hon. the Minister of Militia and Defence—after being signed by all the members of the said committee, subject to the objections raised by the dissenting members.

A copy of the memo. of objections made by the undersigned on behalf of this department to the adoption of the said report of the Survey Committee in its present form, which is to be appended to this document, is also enclosed.

R. STECKEL.

*Mr. Steckel to the Secretary of the Public Works Department:—*

OFFICE OF THE CHIEF CLERK IN CHARGE OF  
PARLIAMENTARY ESTIMATES,  
OTTAWA, Dec. 28, 1908.

FRED. GÉLINAS, Esq.,  
Secretary,  
Public Works Department.

SIR, I have the honour to transmit herewith for the information of the department a copy of a memorandum in reference to the surveys undertaken by this department—which it has been arranged at the first meeting held December 20, 1906, by the members present of the 'Dominion Geodetic and Topographical Survey Committee,' created under an Order-in-Council dated November 13, 1906—should be prepared by me together with similar memos. by the representatives of the other public departments concerned in this matter.

R. STECKEL,  
*Representative of the Public Works Dept. on the  
Dominion Geodetic and Topographical Committee.*



